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DEPARTMENT OF LABOR & ECONOMIC GROWTH DIRECTOR'S OFFICE GENERAL INDUSTRY SAFETY STANDARDS

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PART 4. PORTABLE LADDERS

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GENERAL PROVISIONS

R 408.10401. Scope.

Rule 401. This part establishes minimum requirements for the construction, care and use of portable ladders used in, around or about places of employment.

R 408.10403. Definitions; B to D.

Rule 403. (1) "Brand" means marking by burning with a hot iron.

(2) "Check" means a lengthwise separation of wood less than 6 inches in length and ½ -inch deep, most of which occurs across the rings of annual growth.

(3) "Cleats" means a ladder's crosspieces of rectangular cross section placed on edge on which a person may step to ascend or descend.

(4) "Crack" means a separation of wood cells across the grain line.

(5) "Decay" or "rot" means the disintegration of wood substance due to action of wood-destroying fungi.

R 408.10404. Definitions E.

Rule 404. (1) "Extension ladder" means a non-self supporting portable ladder adjustable in length. It consists of 2 or more sections traveling in guides or brackets so arranged as to permit adjustment of the ladder's length. Its

size is designated by the sum of the lengths of the sections measured along the side rails.

(2) "Extension trestle ladder" means a self-supporting portable ladder, adjustable in length, consisting of a trestle ladder base and a vertically adjustable single ladder, with suitable means for locking the ladders together. The size is designated by the length of the rail of the trestle ladder base.

R 408.10406. Definitions L to R.

Rule 406. (1) "Ladder" means an appliance which usually consists of 2 side rails joined at regular intervals by crosspieces called steps, rungs or cleats, on which a person may step to ascend or descend.

(2) "Ladder stand" means a mobile, fixed size, selfsupporting ladder consisting of flat treads in the form of stairs and may include handrails.

(3) "Pitch" means the included angle between the horizontal and the ladder, measured on the opposite side of the ladder from the climbing side.

(4) "Platform ladder" means a self-supporting type of step ladder of fixed size with a platform provided at the working level. The size is determined by the distance along the front rail from the platform to the base of the ladder.

(5) "Portable ladder" means a ladder not permanently fixed in place and which may be used at various locations.

(6) "Rungs" means a ladder's crosspieces of circular or oval cross section on which a person may step to ascend or descend.

R 408.10407. Definitions; S.

Rule 407. (1) "Safety feet" means a safety device placed on the foot of the side rails to reduce the likelihood of the base slipping. Safety feet may be flat pads covered with a nonslip material, pointed metal projections, or spur wheels.

(2) "Sectional ladder" means a non-self-supporting portable ladder, consisting of 2 or more sections so constructed that the sections, when combined by interlocking, will function as a single ladder. Its size is designated by the overall length of the assembled sections. It is not adjustable.

(3) "Single ladder" means a non-self-supporting portable ladder, nonadjustable in length, consisting of only 1 section. Its size is designated by the overall length of the side rail.

(4) "Special-purpose ladder" means a portable ladder which represents either a modification or a combination of design or construction features in 1 or more of the general purpose types of ladders, as defined in this part in order to adapt the ladder to special or specific uses.

(5) "Split" means a lengthwise separation or lateral fault along the grain line; a tearing apart of the wood cells from 1 surface to the opposite or adjoining surface.

(6) "Step ladder" means a self-supporting portable ladder, non-adjustable in length, having flat steps and a hinged back. Its size is measured along the front edge of the side rails.

(7) "Steps" means the flat crosspieces of a ladder on which a person may step to ascend or descend.

R 408.10408. Definitions T to W

Rule 408. (1) "Trestle ladder" means a self-supporting portable ladder, non-adjustable in length, consisting of 2 sections hinged at the top to form equal angles with the base. The size is designated by the length of the side rails measured along the front edge.

(2) "Worn" means the reduction of a dimension of wood or non-wood part by more than 10% of its original size.

R 408.10413. Brand on wood ladder; mark or tag on nonwood ladder.

Rule 413. (1) A wood ladder purchased for use in, around, or about a place of employment shall bear a brand to show the manufacturer's name, or an appropriate abbreviation thereof, or private label, the last 2 numbers of the year manufactured, ladder grade, and certification of compliance with the United States American Standards, standard A14.1- 1975, Portable Wood Ladders, which is incorporated herein by reference. This standard is available for inspection at the Lansing office of the department of consumer and industry services, and may be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018, or from the Michigan Department of Consumer and Industry Services, 7150 Harris Drive, Box 30643, Lansing, Michigan 48909, at a cost of \$5.00 each. The required information may be stamped into a guide iron on an extension ladder or the metal support of a step ladder cap. Each section of an extension or trestle ladder shall bear the required information.

(2) A nonwood ladder purchased for use in, around, or about a place of employment shall bear a permanent mark or a permanently attached tag, giving the manufacturer's name or private label and the last 2 numbers of the year manufactured, ladder grade and certification of compliance with the American Standard Association standard, A14.2- 1972, Portable Metal Ladders, which is incorporated herein by reference. This standard is available for inspection at the Lansing office of the department of consumer and industry services and may be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018, or from the Michigan Department of Consumer and Industry Services, 7150 Harris Drive, Box 30643, Lansing, Michigan 48909 at a cost of \$4.25 each.

(3) A portable rung ladder provided and used by a life support organization, such as a fire or police department, is not subject to rules 413(1) and (2), 427, 441(1), 445(4), (5) and (7) and 447(3), if the ladder specifications exceed the requirements of USAS-A14.1-1968 or ASAS-A14.2-1956.

(4) A ladder purchased prior to January 15, 1972, may be used without the marking required in subrules (1) and (2), but shall conform to ANSI A14.1-1975 or A14.2-1972.

WOOD LADDERS

R 408.10421. Portable wood ladders, metal and wood parts.

Rule 421. (1) The strength of metal parts and fittings of a portable wood ladder shall not be less than the design requirements of the ladder to which they are affixed.

(2) Wood parts shall meet the United States American Standards, standard A.14.1-1975 when repairs are made. This standard is available as noted in rule 413(1).

R 408.10422. Portable wood step ladders.

Rule 422. A step ladder shall be only of a type as follows:

- (a) Type I — which shall be an industrial step ladder, 3 to 20 feet in length and manufactured for heavy duty, such as used by utilities, contractors and industries.
- (b) Type II — commercial step ladder, 3 to 10 feet for medium duty, such as used by painters, offices and light industries.

R 408.10427. Portable rung ladder lengths.

Rule 427. (1) A portable rung ladder which is of a greater length than given in table 1 shall not be used.

(2) Table 1 reads as follows:

TABLE 1
PORTABLE RUNG LADDER LENGTHS

Type of Ladder	Maximum Length
Single ladder	22 feet
Two-section extension ladder	40 feet
Three-section extension ladder	60 feet
Assembled section ladder	21 feet
Trestle ladder or extension sections or base sections of an extension trestle ladder	18 feet

R 408.10428. Portable rung extension ladders.

Rule 428. (1) A portable rung extension ladder shall consist of 1 section which shall fit within the side rails of another section and arranged in such a manner that the upper sections may be raised or lowered.

(2) The minimum overlap of adjacent sections of a 2 or 3 section portable rung extension ladder shall be as follows:

Size of ladder in feet for all sections	Overlap of each section in feet
Up to and including 32	3
Over 32 up to and including 48	4
Over 48 up to and including 60	5

(3) A portable rung extension ladder shall have positive means which ensure the overlap as specified in subrule (2) of this rule.

R 408.10431. Special-purpose ladders.

Rule 431. (1) A special-purpose ladder may be capable of being used as, but not limited to, a step ladder, a single or extension ladder, or a trestle ladder.

(2) A special-purpose ladder, when used as any of the type of ladder listed in subrule (1) of this rule, shall meet the requirements of the applicable rules of this part.

(3) A special-purpose ladder may be used by more than one employee if specifically designed for that purpose.

(4) A platform step ladder shall be constructed in accordance with the requirements for a type I step ladder or a type II step ladder. A platform of a platform ladder shall be capable of supporting a load of 200 pounds placed at any point on the platform.

(5) A type II step ladder which is used for painting may have its top omitted.

R 408.10432. Cleat ladders.

Rule 432. (1) A cleat ladder which is longer than 22 feet shall not be used.

(2) Wood in a cleat ladder shall be straight grained and knot free.

(3) Wood side rails of a cleat ladder shall be not less than 2 by 4 inches nominal. Wood cleats of a cleat ladder may be not less than 1 by 4 inches nominal.

(4) The distance between the side rails of a cleat ladder shall be at least 14 ½ inches, but not more than 16 ½ inches.

(5) Wooden cleats shall be inset into the 2 side rails of a cleat ladder not less than ½ inch or attached directly to the edge of the side rails if filler blocks the thickness of the cleats are securely attached to the edge of the rail for the entire length between the cleats. The cleats shall be fastened to each rail by at least 3 size 10-d wire nails.

R 408.10433. Ladder stands.

Rule 433. (1) A ladder stand shall be capable of sustaining the specified load.

(2) The load, which shall be calculated on the basis of 1 or more 200-pound employees, together with 50 pounds of equipment each, shall be applied uniformly to a 3 ½ inch wide area, front to back, at the center of the width span, with a safety factor of 4.

(3) The maximum height at the working level shall be not more than 4 times the minimum base dimension. A ladder stand which does not meet this requirement, shall be provided outrigger frames to achieve this least base dimension.

(4) The step width shall be not less than 16 inches and the steps shall have a slip resistant surface.

(5) Not less than 2 of the 4 casters of a ladder stand shall be the swivel type and the caster shall be provided with positive wheel lock, swivel lock or both to prevent movement.

(6) Steps shall be uniformly spaced and sloped, with a rise of not less than 9 inches nor more than 10 inches, and a depth of not less than 7 inches. The slope of the steps section shall be a minimum of 55 degrees and a maximum of 60 degrees, measured from the horizontal.

(7) Handrails shall be a minimum of 29 inches high. Measurements shall be taken vertically from the center of the step. Units having more than 5 steps, or 60 inches vertical height to the top step, shall be equipped with handrails.

R 408.10441. Handling and transporting ladders.

Rule 441. (1) A ladder shall be handled with reasonable care and not subjected to deliberate dropping or to misuse. A ladder shall not be used as a plank or skid.

(2) A ladder which is carried on a vehicle shall be secured to prevent it from catapulting or falling from the vehicle.

R 408.10442. Maintenance.

Rule 442. (1) A ladder shall not be painted with an opaque material. A ladder, particularly one used out of doors should be coated with a suitable transparent protective material to retard splintering caused by weathering.

(2) The side rails and legs of a ladder shall be kept free from splinters. The joint between the side rail and step shall be kept tight, and metal hardware and fittings secured.

(3) A ladder including its safety feet shall be kept free of oil, grease, mud or any similar slippery substances.

(4) The locks, pulleys, spreader joints or other movable metal parts of a ladder shall operate freely without undue play. Lubricants shall be applied as needed.

(5) A rope used on a ladder shall not have a long or loosely twisted lay, shall be free of burns and cuts and shall not show evidence of weakness resulting from fraying, wear, mildew or rot. Rope ends shall be fastened or whipped.

R 408.10443. Inspection and repair or replacement.

Rule 443. (1) A ladder shall be inspected before its use and after it has fallen or been involved in an accident to determine its condition. A ladder shall be repaired or replaced if it shows:

- Splits in it side rails through to opposite surfaces in excess of 3 inches at the rungs or 6 inches along the rails. Splits singly or in combination along the same grain line shall not exceed 6 inches in any 1 foot. Splits through to the opposite broad faces exceeding 6 inches but not more than 1 ½ feet in length in single or combined lengths may be closed with a 3/16 inch diameter wagon box-head rivet centrally located in the narrow face of the rail. Where the split runs through rung holes, the rivets shall be placed approximately 2 inches from the center of each rung so effected. This subdivision does not refer to checks in a ladder.
- Gouges, dents or other damage that may be dressed smooth if the rail is not reduced by more than 10% of the thickness or depth. Damage to corner edges, including splits, may be dressed to a smooth bevel, if the cross section is not reduced by more than 10% of its original area.
- Worn, crushed, cracked, split, splintered or missing rungs, steps, tops or platforms.
- Longitudinal play of ¾ inch in the rails due to looseness of rungs or steps.

(e) Broken or bent guide irons, spreaders or locks.

(2) A ladder with a defect, described in subrule (1), shall be tagged, "**Dangerous. Do Not Use.**" and it shall be removed from service for repair or destruction. Improvised repairs shall not be made.

R 408.10445. Use of ladders.

Rule 445. (1) A ladder shall not be placed in front of a door which opens toward the ladder unless the door is blocked open, locked, guarded by a person or protected by a barricade.

(2) A ladder shall not be placed on a box, barrel or other unstable base.

(3) A climber shall face the ladder when ascending or descending.

(4) A ladder shall not be used as a brace, skid, guy, gin pole, gang way, or for any other use than that for which it is intended.

(5) A person on a single or sectional ladder shall not over-reach, nor do any pushing or pulling that may cause the ladder to move or topple. If both shoulders are outside the side rail, the user is over-reaching.

(6) The user shall not stand astride a ladder and another object.

(7) A single or sectional ladder manufactured pursuant to these rules shall not be used by more than 1 person at a time.

R 408.10446. Use of step ladders.

Rule 446. (1) A step ladder which is being used shall be opened fully and its spreaders locked.

(2) Each leg of a step ladder shall be in contact with solid footing. A board or plank may be used to secure footing on uneven ground.

(3) If a step ladder does not have a guard rail, the top step and cap shall not be used to work from or to climb on.

(4) A folded step ladder shall not be used as a straight ladder by leaning it against a wall or other support.

(5) When carrying objects up ladders, 1 hand should be kept free to maintain balance and security.

(6) The bracing on the back legs of a step ladder shall not be used for climbing, except as provided in R 408.10431 of this part.

R 408.10447. Use of straight, sectional, and extension ladders.

Rule 447. (1) A straight, sectional or extension ladder shall be placed so that the side rails have a secure footing. Where the surface is uneven, boards, planks, or leveling jacks may be used to create an even surface. A straight, sectional, or extension ladder shall have safety feet. The ladder shall be placed so as to prevent slipping or it shall be lashed or held in position.

(2) A portable non-self-supporting ladder should be erected at a pitch of 75 ½ degrees for maximum balance and strength. This may be accomplished by placing the base out from the wall or other support ¼ of the working length of the ladder.

(3) Ladders shall not be tied or fastened together to provide longer sections other than with the hardware provided by the manufacturer.

(4) A person using a straight or extension ladder shall not stand on the top 2 rungs or within 3 feet from the top of the ladder.

(5) If the top of the ladder is secured to an object, the user may secure himself to the ladder by placing 1 leg over the second rung above the rung on which he is standing.

(6) When using a ladder to go from 1 landing to another, the ladder shall extend above the upper landing by not less than 3 feet.

(7) The top rest for a straight or extension ladder shall be reasonably rigid and shall have ample strength to support the applied load.

NON-WOOD LADDERS

R 408.10451. Construction of ladders.

Rule 451. (1) The design and construction of a portable non-wood ladder shall be such as to produce a ladder without structural defects or accident hazards such as sharp edges or burrs.

(2) Rungs or steps of portable non-wood ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping.

R 408.10452. Specifications.

Rule 452. (1) A non-wood straight or extension ladder shall comply with rules 427 to 428, except a non-wood portable extension ladder with an interlocking rail section, such as a channel, shall have not less than a single guide iron on each rail.

(2) To be classified as a standard length ladder, the measured length shall be within plus or minus 1.2 inch of the specified length. A non-wood step ladder which exceeds 16 feet in length shall not be used. The bottom of each rail of a non-wood step ladder shall have nonslip material.

(3) A non-wood trestle ladder or extension sections or base section of a non-wood extension trestle ladder shall comply with rule 427.

(4) The length of a non-wood platform ladder shall not exceed 16 feet.

(5) A non-wood platform ladder shall comply with rule 422.

R 408.10454. Non-wood ladder care and maintenance.

Rule 454. (1) A non-wood ladder shall be maintained pursuant to rule 441 and 442(3), (4) and (5).

(2) A non-wood ladder shall be inspected before being used and after it has fallen or been involved in an accident to determine its condition.

(3) A non-wood ladder shall be repaired or replaced if it shows: cracked, bent or twisted side rails or legs; rungs where opposite surfaces are bent or deformed; loose or broken rivets and bolts, or other fasteners; broken or bent spreaders, guides or locks.

R 408.10456. Use of non-wood ladders.

Rule 456. (1) A metal ladder, except a ladder provided and used by a life support organization such as a fire department, shall not be furnished or used near an exposed or open electrical source.

(2) A non-wood ladder shall be used pursuant to rules 445 to 447.

(3) When in use, a non-wood, non-self-supporting ladder shall be placed so that the 2 side rails are supported, unless equipped with a single attachment capable of supporting the imposed load.

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